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I, Christian König, hereby swear, under penalty of perjury, that the attached document was translated by me and to the best of my knowledge and belief is a true and accurate translation of the corresponding German document:

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(Christian König)

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Device for inline-coating of materials to be printed in offset printing presses.

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Device for inline-coating of materials to be printed in offset printing presses

The invention concerns a device for the coating of materials to be printed in multi-color offset printing presses with several coating stations.

The article "*Goldlackdruck löst Metall-Bronzierung ab*[1]" in the magazine *FlexoDruck*, 2-93, pages 42-43 describes the processing of gold lacquer in a multi-color offset printing press with two so-called coating towers. For this purpose, one of the coating towers was converted to a flexographic station, whereby a flexographic printing plate was used for coating, together with conventional lacquering technology. In regard to conventional metering methods for lacquer, the option of using a chamber doctor was pointed out.

DE 3 906 648 A1 describes an applicator unit for high-viscosity oil-based, or low-viscosity water-soluble layers. This applicator unit is configured as a coating unit, alternatively as an offset-, relief-, or intaglio-printing unit. These configurations are based on a textured pick-up roller, which is in contact with a doctor blade, or on an applicator roller and a textured form cylinder, which is in contact with a doctor blade. Hereby, the relief-printing unit consists of a pick-up roller that contains ink cells, and to which a doctor blade is assigned, a transfer roll, to which smoothing rolls are assigned, and a form cylinder that carries a relief form.

[1] Gold lacquer printing replaces metal-bronzing (The Translator)

DE 4 122 990 A1 describes a bronze- and effect printing ink and a process for bronze- or effect printing. It describes a water-soluble printing ink of high viscosity and high pigment content. This ink is to be processed out of the coating station of an offset machine or out of a flexographic station. The short processing path with few ink separations is listed as an advantage.

A so-called chamber doctor for applying a coating material onto a coating roller is well known, e.g. from DE 3 614 582 A1. At least two doctor blades are in contact with a roller and form a chamber for accepting a material, which is supplied under pressure.

Object of the invention is to further develop a coating station according to the characterizing portion of claim 1, to allow in a simple manner the problem-free inline processing of quickly evaporating printing inks with high pigment content or rough pigments in combination with further subsequent printing- and coating processing steps.

This objective is solved by the characterizing portion of the independent claim. Further developments follow from the dependent claims.

This invention's solution makes it possible to carry out inline-coating in an offset printing press using high-viscosity liquids, with special consideration for water-based lacquers or pigmented inks (metallic gloss printing). Potential fields of application are the selective coating (spot coating) or the coating of complete areas. Evaporation of the employed liquids is reduced due to the closed design of the chamber of the chamber doctor. This improves the processing of quickly evaporating, e.g. water-soluble, liquids. The combination of several offset printing stations and at least one flexographic station can be implemented in various configurations, whereby as a rule an additional lacquering station, e.g. for the coating of solid areas, is positioned downstream of these devices.

In the following, the invention is explained by way of example.

Fig. 1 shows a first installation for coating, and

Fig. 2 shows a variant of the coating installation.

Figure 1 shows a multi-color offset printing press with two lacquering stations. The offset printing press (shown here without the feeder- and delivery attachments) consists of five printing stations 1 to 5, connected thereto in sheet running direction a coating station configured as a flexographic station 6, and downstream thereof a conventional lacquering station 7. Hereby, the flexographic station 6 can be employed as a spot coating device (for selective lacquering) and the downstream lacquering station 7 can be employed for solid-area surface finishing.

The flexographic station 6, as well as the lacquering station 7, each consist of one impression cylinder 8.1, 8.2, one transfer drum 9.1, 9.2, and one form cylinder 10.1, 10.2.

A flexible relief printing plate, e.g. a flexographic printing plate, is mounted on the form cylinder 10.1 in the flexographic station 6. An applicator roller 11 with a surface textured with ink cells, a so-called anilox roller, is in contact with the form cylinder 10.1. A doctor chamber 12 is associated with, and can be positioned on, the applicator roller 11. The doctor chamber 12 can, for example, be equipped with a supply inlet for liquids centered on its top panel and with two discharging outlets for liquids in its lateral areas. The liquid-supply inlet is connected to a feed pump, while the liquid-discharge outlets 11 are connected to a suction pump. The pumps are required to be able to process a liquid that is of high viscosity due to the pigmentation, e.g. a water-based liquid, such as for example gold- and silver printing ink, opaque white, or lacquer.

The ink cells of the applicator roller 11 transport the coating material for the inking of the relief form to the form cylinder 10.1, where the coating material is applied to the material to be printed that is being fed by the impression cylinder 8.1. While the applicator roller 11 provides for the transport of liquids, the chamber doctor ensures that the liquid remains only in the ink cells.

In contrast, the lacquering station 7 contains a roller pair that forms a metering nip. Herein, a metering roller 13 is positioned directly on an applicator roller 14. The coating substance is fed directly into the nip between the two rollers and is supplied to the form cylinder 10.2 by the applicator roller 14. At the impression cylinder 8.2, the form cylinder then applies the coating substance onto the material to be printed that is being supplied.

The staggered arrangement of offset printing, flexography, and lacquering yields very good operational results, especially in metal-gloss coatings. Hereby one must emphasize the combination of rapid processing of the quickly-evaporating metallic printing ink or printing lacquer and the subsequent coating with lacquer, which improves the gloss.

Fig. 2 shows a similar system. Here, the flexographic station 6 is employed upstream of the first printing station 1 of the offset printing press. Using such a configuration, it is possible to apply base-coatings prior to printing, e.g. opaque white coatings on sheet metal, plastic film, or card stock. Furthermore, the final lacquering can be achieved by placing a lacquering station 7 downstream of the final printing station 5, or by arranging an integrated lacquering unit with a conventional printing station.

Also comparable[2] is a placement of the flexographic station 6 within the offset printing press for applying intermediary coatings, for instance including a drying function.

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[2] The German original suffers from poor grammar, which makes a determination of the exact meaning impossible. This interpretation assumes the German 'Vergleich' is meant to read 'Vergleichbar'. (The Translator).

Claims

1.) Device, preferably in sheet-fed rotary printing presses for multi-color offset printing for the coating of materials to be printed containing at least two lacquering stations,
whereby
each lacquering station comprises one impression cylinder (8), one form cylinder (10), and one applicator roller (11, 14), and the lacquering station that is upstream with respect to the sheet running direction is configured as a flexographic station (6).

2.) Device according to claim 1 wherein
the flexographic station (6) is equipped with an applicator roller (11), with which is associated an adjustable chamber doctor (12), whereby the applicator roller (11) is configured as an anilox roller.

3.) Device according to claim 1 and 2 wherein
a conventional lacquering station (7) is located directly or indirectly downstream of the flexographic station (6), and the lacquering station (7) is equipped with an applicator roller (14), with which is associated an adjustable metering roller (13) to form a common metering nip.

4.) Device according to claims 1 and 2 wherein
the flexographic station (6) consists of the following elements:
the form cylinder (10.1), which carries a relief form and is in contact with the impression cylinder (8.1), the applicator roller (11) with screen texture, which is in contact with the form cylinder (10.1), and the chamber doctor, which is equipped with a feed pump for liquid supply and a suction pump for liquid return.

5.) Device according to claims 1 and 2 wherein the flexographic station (6) in an offset printing press is placed in between the printing stations (1-5).

6.) Device according to claims 1 and 2 wherein the flexographic station (6) in an offset printing press is placed upstream of the printing stations (1-5).

7.) Device according to claims 1 and 2 wherein the flexographic station (6) in an offset printing press is placed downstream of the printing stations (1-5).

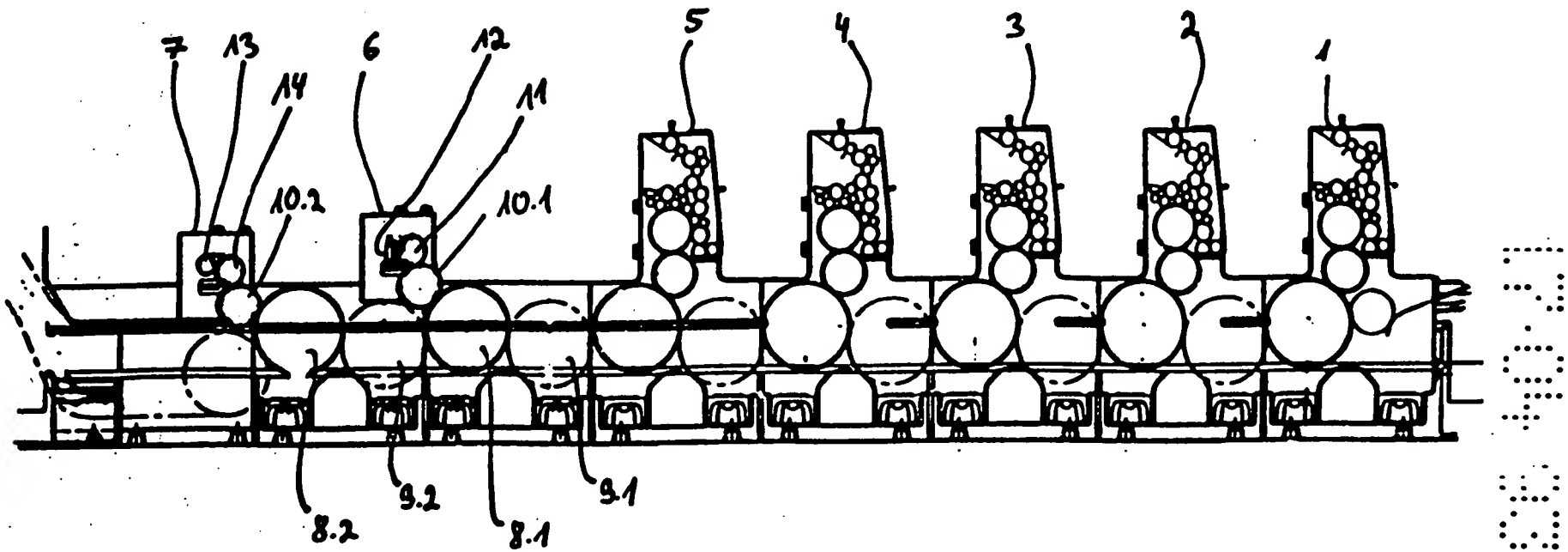

Fig. 1

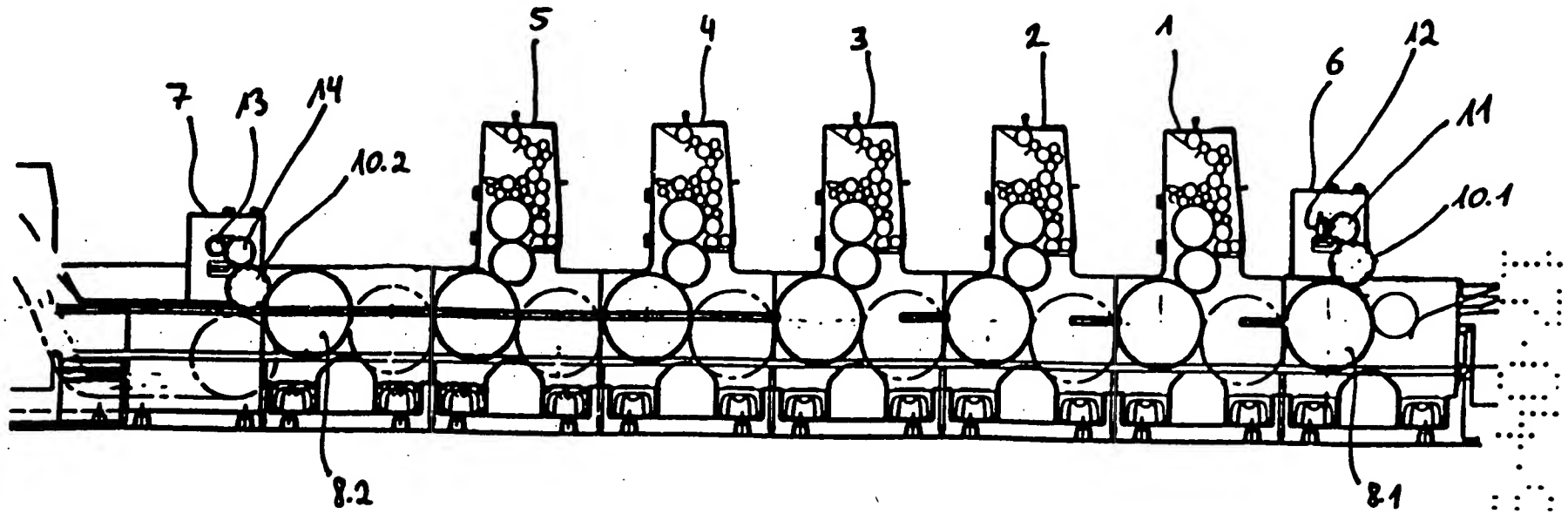

Fig. 2